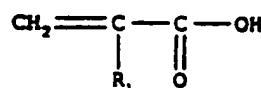


I Claim:

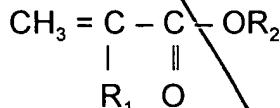
1. A composition comprising, in a cosmetically acceptable support suitable for dyeing the hair, at least one direct dye and at least one crosslinked polymer containing acrylic residue units of the structure



5 in which  $\text{R}_1$  denotes H,  $\text{CH}_3$  or  $\text{C}_2\text{H}_5$ , and  $\text{C}_{10}-\text{C}_{30}$  alkyl acrylate residue units, wherein said composition is a direct dyeing composition for the hair, and wherein said at least one direct dye is chosen from an acidic anthraquinone dye, a cationic anthraquinone dye, an acidic azo dye, and a cationic azo dye.

10 2. A composition according to claim 1, wherein said at least one crosslinked polymer comprises:

- (a) residue units of one of an acrylic, methacrylic or ethacrylic acid,
- (b) residue units of an acrylate of formula:



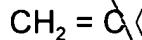
15 in which:

$\text{R}_1$  denotes H or  $\text{CH}_3$  or  $\text{C}_2\text{H}_5$ , and

*S-12*  
*CH<sub>2</sub> = C <*  
*and also containing at least one other polymerizable group, wherein the*  
*unsaturated bonds in said CH<sub>2</sub> = C < group and said at least one other polymerizable*  
*group are not conjugated with each other.*

R<sub>2</sub> denotes an alkyl radical having from 10 to 30 carbon atoms, and,

(c) residue units of a crosslinking polymerizable monomer containing a group



5 and also containing at least one other polymerizable group, wherein the unsaturated bonds in said  $\text{CH}_2 = \text{C} <$  group and said at least one other polymerizable group are not conjugated with each other.

3. A composition according to claim 2, wherein at least one of the following conditions is true:

(1) said at least one crosslinked polymer is a terpolymer, and wherein said terpolymer contains: (a) residue units of one of acrylic or methacrylic acid;

10 (2) R<sub>1</sub> denotes H or CH<sub>3</sub>;

(3) R<sub>2</sub> denotes a C<sub>12</sub>-C<sub>22</sub> alkyl radical; and

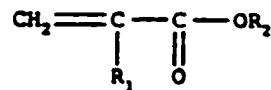
(4) said crosslinking polymerizable monomer is a polyallyl ether.

4. A composition according to claim 3, wherein said polyallyl ether is selected from polyallylsucrose and polyallylpentaerythritol.

15 5. A composition according to claim 3, wherein said terpolymer contains:

(a) residue units of an acrylic acid

(b) residue units of an acrylate of formula:



in which:

R<sub>1</sub> denotes H or CH<sub>3</sub>, and

R<sub>2</sub> denotes an alkyl radical having from 12 to 22 carbon atoms, and

(c) residue units of a polyallyl ether.

5        6.      A composition according to claim 2, wherein said residue units (a) are present in an amount ranging from 60 to 95% by weight, said residue units (b) are present in an amount ranging from 4 to 40% by weight, and said residue units (c) are present in an amount ranging from 0.1 to 6% by weight, relative to the total weight of the crosslinked polymer.

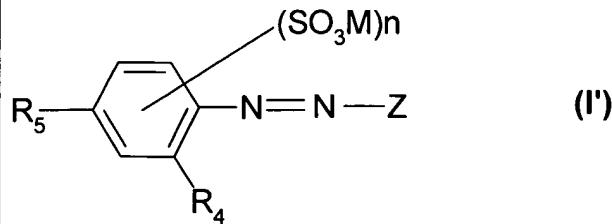
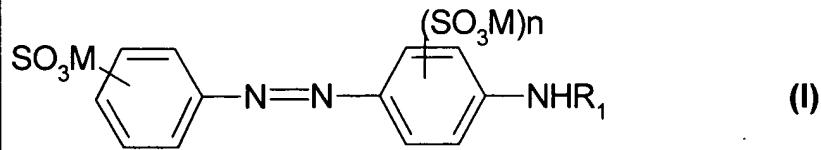
10       7.      A composition according to claim 6, wherein said residue units (a) are present in an amount ranging from 96 to 98% by weight, said residue units (b) are present in an amount ranging from 1 to 4% by weight, and said residue units (c) are present in an amount ranging from 0.1 to 0.6% by weight, relative to the total weight of the crosslinked polymer.

*SAC*

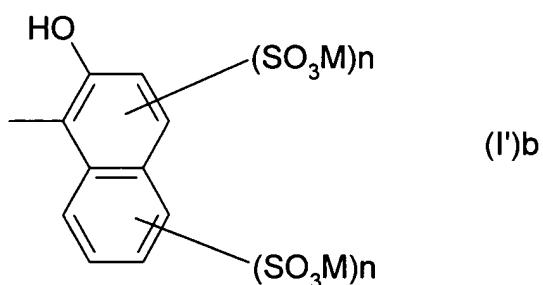
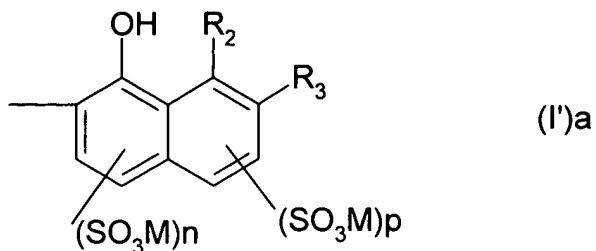
8. A composition according to claim 1, wherein said at least one crosslinked polymer is present in an amount ranging from 0.05 to 5% by weight relative to the total weight of said composition.

9. A composition according to claim 8, wherein said at least one crosslinked polymer is present in an amount ranging from 0.1 to 3% by weight relative to the total weight of said composition.

10. A composition according to claim 1, wherein said at least one direct dye is an acid azo dye of formulae (I) or (I'):



in which Z denotes (I')a or (I')b:



in which:

5      n denotes zero or 1,

      p denotes zero, 1 or 2,

M denotes H or an alkali or alkaline-earth counterion, an organic amine which may be hydroxylated or not hydroxylated, or ammonia,

R<sub>1</sub> denotes H, a C<sub>1</sub>-C<sub>4</sub> alkyl radical or an cycloalkylaryl radical,

R<sub>2</sub> denotes H, an -NH<sub>2</sub> radical, an -HN-CO-CH<sub>3</sub> radical or an -NSO<sub>2</sub>-phenyl radical,

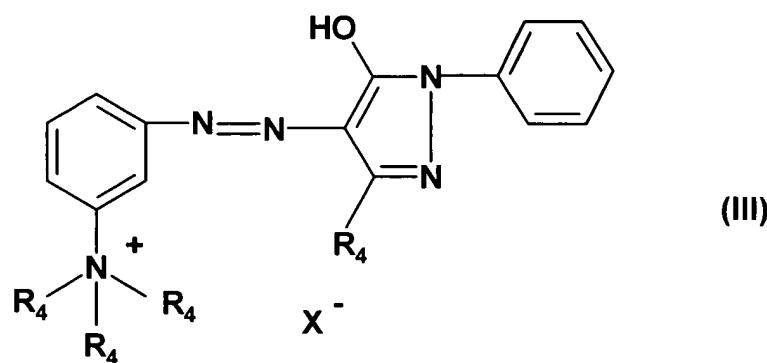
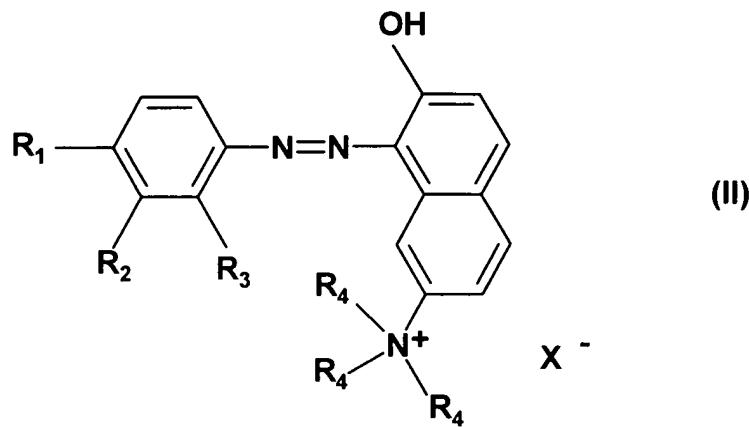
R<sub>3</sub> denotes H, or a -N=N-(para-nitrophenyl) radical,

R<sub>4</sub> denotes a H, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, or forms a naphthalenyl ring with the adjacent carbon atom which is unsubstituted of the phenyl group,

R<sub>5</sub> denotes H, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, an -SO<sub>3</sub>Na radical, a -NH<sub>2</sub> radical, an -HN-CO-CH<sub>3</sub> radical or an -NO<sub>2</sub> radical, and in which at least one -SO<sub>3</sub>M group is present in formulae (I), (I')a and (I')b.

11. A composition according to claim 1, wherein said at least one direct dye is a cationic azo dye of formulae (II), (III), (IV), (V), (VI), (VI'), (VII) and their mesomeric forms, wherein

(i) dyes of formulae (II) and (III) are:



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in which:

R<sub>1</sub> denotes H or an -NH<sub>2</sub> radical,

R<sub>2</sub> denotes H or a -NO<sub>2</sub> radical,

R<sub>3</sub> denotes H or a -NO<sub>2</sub> radical or an C<sub>1</sub>-C<sub>4</sub> alkoxy radical,

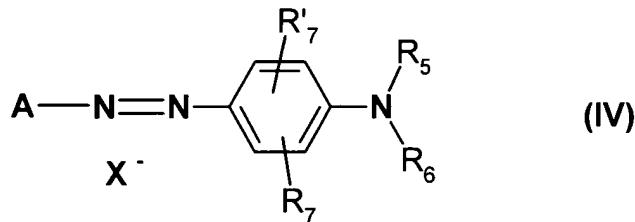
5 R<sub>4</sub> denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

X<sup>-</sup> denotes an anion chosen from chloride, methyl sulphate and acetate,

wherein;

(ii) dyes of formulae (IV), (V), (VI), (VI'), (VII) include:

a) the compounds of formula (IV):



10 in which:

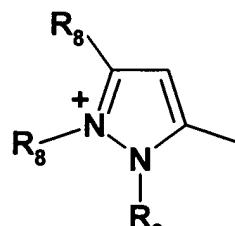
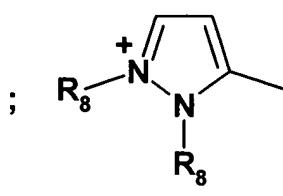
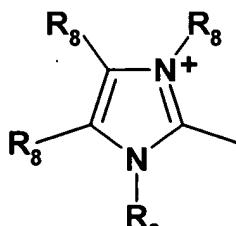
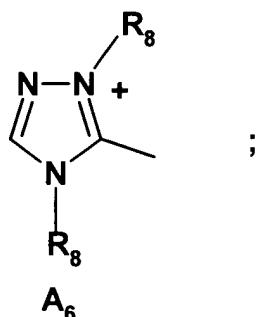
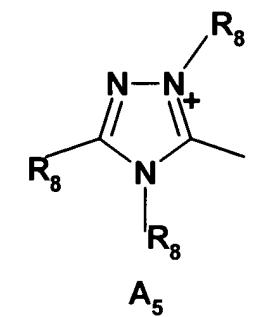
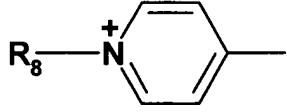
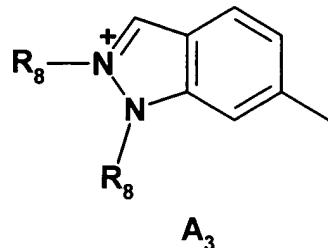
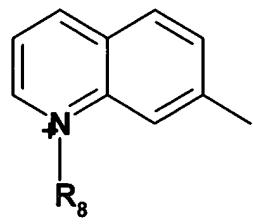
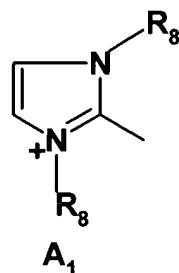
R<sub>5</sub> and R<sub>6</sub>, which may be identical or different, denote a hydrogen atom, C<sub>1</sub>-C<sub>4</sub> alkyl radicals which can have a substituent chosen from -CN, -OH and -NH<sub>2</sub> radicals, and a 4'-aminophenyl radical, or form, with a carbon atom of the benzene ring, a heterocycle, oxygenated and/or nitrogenated and optionally having at least one substituent chosen from C<sub>1</sub>-C<sub>4</sub> alkyl radicals,

15 R<sub>7</sub> and R'<sub>7</sub> which may be identical or different, denote a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a cyano radical,

a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, or an acyloxy radical,

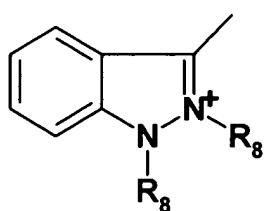
X<sup>-</sup> denotes an anion chosen from chloride, methyl sulphate and acetate;

A is a group chosen from structures A<sub>1</sub> to A<sub>19</sub>:

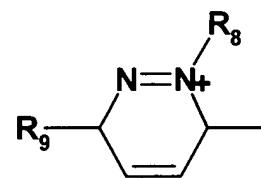


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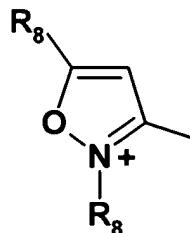
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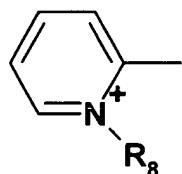
A<sub>10</sub>



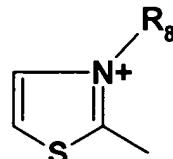
A<sub>11</sub>



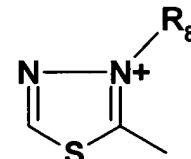
A<sub>12</sub>



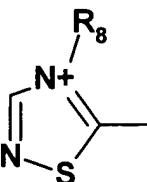
A<sub>13</sub>



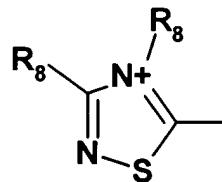
A<sub>14</sub>



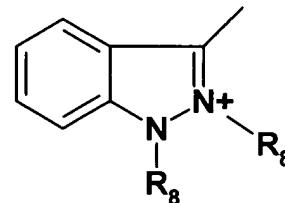
A<sub>15</sub>



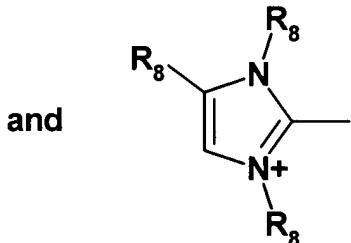
A<sub>16</sub>



A<sub>17</sub>



A<sub>18</sub>



A<sub>19</sub>

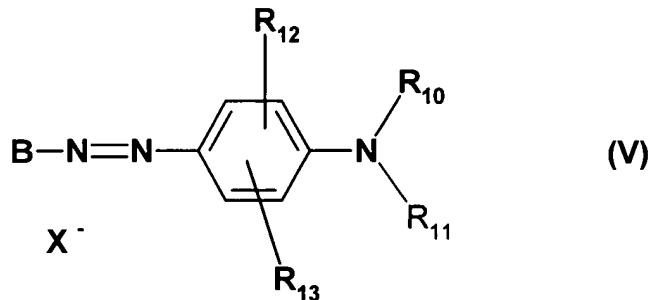
and

in which,

$R_8$  denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical which can be substituted with a hydroxyl radical and

$R_9$  denotes a C<sub>1</sub>-C<sub>4</sub> alkoxy radical,

b) the compounds of formula (V):



in which:

$R_{10}$  denotes hydrogen or a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

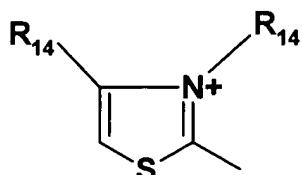
$R_{11}$  denotes hydrogen or a C<sub>1</sub>-C<sub>4</sub> alkyl radical optionally having a substituent chosen from a -CN radical, an amino radical, and a 4'-aminophenyl radical, or forms with

10  $R_{10}$  a heterocycle, oxygenated and/or nitrogenated and optionally having at least one substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

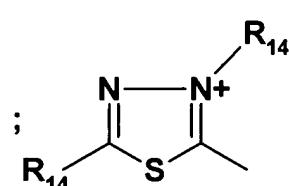
$R_{12}$  and  $R_{13}$ , which may be identical or different, denote a hydrogen atom, a halogen atom chosen from bromine, chlorine, iodine or fluorine, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, or a -CN radical,

$X^-$  denotes an anion chosen from chloride, methyl sulphate and acetate;

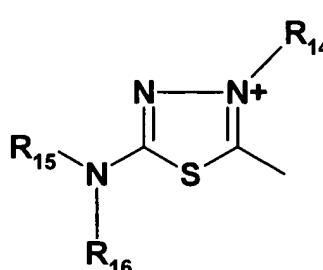
B is a group chosen from structures B1 to B6:



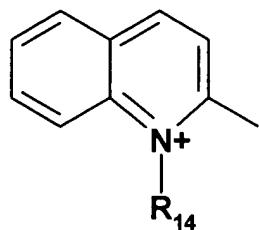
B1



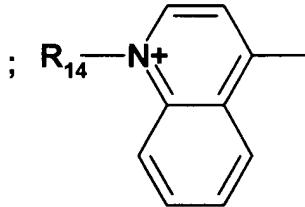
B2



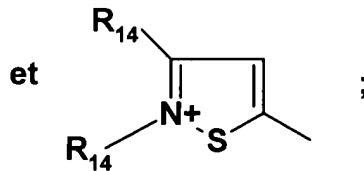
B3



B4



B5



B6

in which,

5

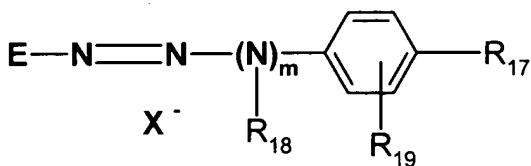
$R_{14}$  denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical, and

$R_{15}$  and  $R_{16}$ , which may be identical or different, denote a hydrogen atom or a C<sub>1</sub>-C<sub>4</sub> alkyl radical;

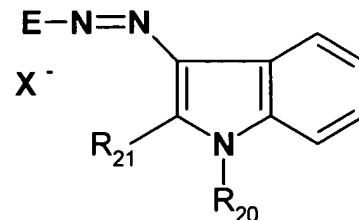
c) the compounds of formulae (VI) and (VI'):

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(VI)



(VI')

in which:

5  $R_{17}$  denotes a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, a halogen atom chosen from bromine, chlorine, iodine and fluorine, an unsubstituted amino radical, or a substituted amino radical,

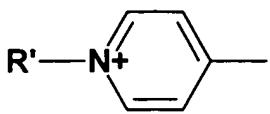
10  $R_{18}$  denotes a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, or forms with a carbon atom of the benzene ring, a heterocycle which is optionally oxygenated and optionally having at least a substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

15  $R_{19}$  denotes a hydrogen atom or a halogen atom chosen from bromine, chlorine, iodine and fluorine,

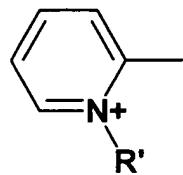
$R_{20}$  and  $R_{21}$ , which may be identical or different, denote a hydrogen atom or a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

$m$  is zero or 1,

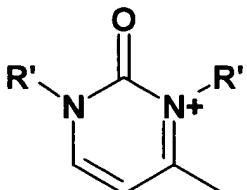
15  $X^-$  denotes an anion chosen from chloride, methyl sulphate and acetate;  
E is a group chosen from structures E1 to E8:



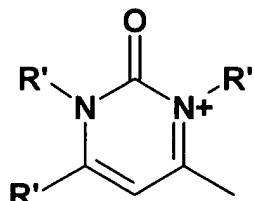
E1



E2



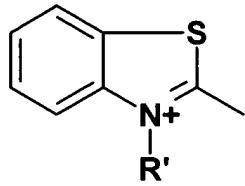
E3



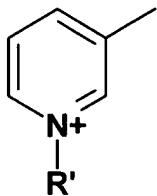
E4



E5

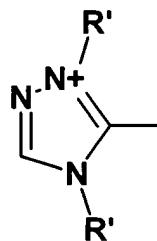


E6



E7

and

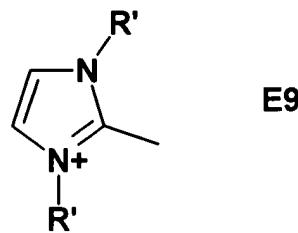


E8

in which,

5 R' denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

when m is 0, then E can also be a group of structure E9:



in which,

R' denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

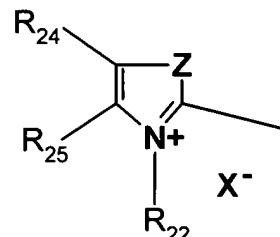
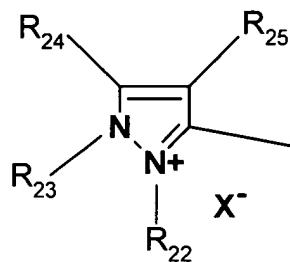
d) the compounds of formula (VII):



5

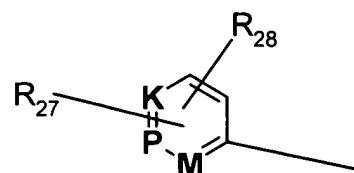
in which,

the symbol G represents a group chosen from structures G1 to G3:



G<sub>1</sub>

G<sub>2</sub>



**G<sub>3</sub>**

in which,

R<sub>22</sub> denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical or a phenyl radical optionally having a substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical and a halogen atom chosen from chlorine, bromine, iodine and fluorine,

R<sub>23</sub> denotes a C<sub>1</sub>-C<sub>4</sub> alkyl radical or a phenyl radical,

5        R<sub>24</sub> and R<sub>25</sub>, which may be identical or different, denote a C<sub>1</sub>-C<sub>4</sub> alkyl radical or a phenyl radical or, in the case of structure G<sub>1</sub>, can together form a benzene ring having at least one substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical and an -NO<sub>2</sub> radical, and in the case of structure G<sub>2</sub>, can together form a benzene ring optionally having at least one substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> 10        alkoxy radical and an -NO<sub>2</sub> radical, wherein R<sub>24</sub> can also denote a hydrogen atom,

Z denotes chosen from an oxygen atom, a sulphur atom or an -NR<sub>23</sub> radical;

M denotes a -CH radical, a -CR radical wherein R is chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, or an -NR<sub>26(X<sup>-</sup>)<sub>r</sub></sub> radical, wherein r is zero or 1,

15        K denotes a -CH radical, a -CR radical wherein R is chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, or an -NR<sub>26(X<sup>-</sup>)<sub>r</sub></sub> radical wherein r is zero or 1,

P denotes a -CH radical, a -CR radical wherein R is chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, or an -NR<sub>26(X<sup>-</sup>)<sub>r</sub></sub> radical wherein r is zero or 1,

R<sub>26</sub> denotes an oxygen atom, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical or a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

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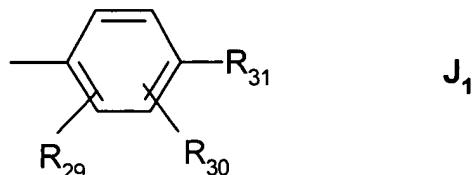
R<sub>27</sub> and R<sub>28</sub>, which may be identical or different, denote a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical or an -NO<sub>2</sub> radical,

5 X<sup>-</sup> denotes an anion chosen from chloride, iodide, methyl sulphate, ethyl sulphate, acetate and perchlorate, and

wherein at least one of K, M or P denotes -NR<sub>26</sub>(X<sup>-</sup>)<sub>r</sub>,

wherein the symbol J is chosen from:

(a) a group of structure J<sub>1</sub>:



10 in which,

R<sub>29</sub> denotes a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, a -OH radical, an -NO<sub>2</sub> radical, an -NHR<sub>32</sub> radical, an -NR<sub>33</sub>R<sub>34</sub> radicals, an -NHCO(C<sub>1</sub>-C<sub>4</sub>)alkyl radical, or forms with R<sub>30</sub> a 5- or 6-membered ring which may contain at least one hetero atom chosen from nitrogen, oxygen and sulphur,

15 R<sub>30</sub> denotes a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> alkoxy radical, or forms, with R<sub>31</sub> or

R<sub>32</sub> a 5- or 6-membered ring which may contain at least one hetero atom chosen from nitrogen, oxygen and sulphur,

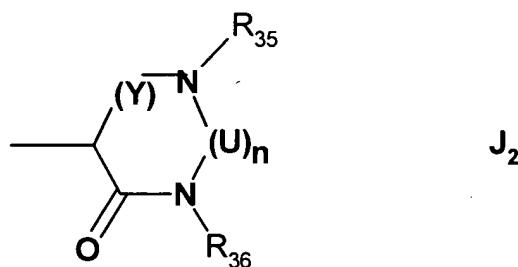
R<sub>31</sub> denotes a hydrogen atom, an -OH radical, an -NHR<sub>32</sub> radical or an -NHR<sub>33</sub>R<sub>34</sub> radical,

5 R<sub>32</sub> denotes a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> monohydroxyalkyl radical, a C<sub>2</sub>-C<sub>4</sub> polyhydroxyalkyl radical or a phenyl radical,

R<sub>33</sub> and R<sub>34</sub>, which may be identical or different, denote a C<sub>1</sub>-C<sub>4</sub> alkyl radical, a C<sub>1</sub>-C<sub>4</sub> monohydroxyalkyl radical or a C<sub>2</sub>-C<sub>4</sub> polyhydroxyalkyl radical, and

10 (b) a 5- or 6-membered nitrogenous heterocyclic group which can contain at least one other hetero atom and/or at least one carbonyl group and which can have at least one substituent chosen from a C<sub>1</sub>-C<sub>4</sub> alkyl radical, an amino radical or a phenyl radical.

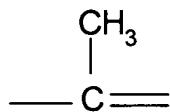
12. A composition according to claim 11, wherein said 5- or 6-membered nitrogenous heterocyclic group is chosen from a group of structure J<sub>2</sub>:



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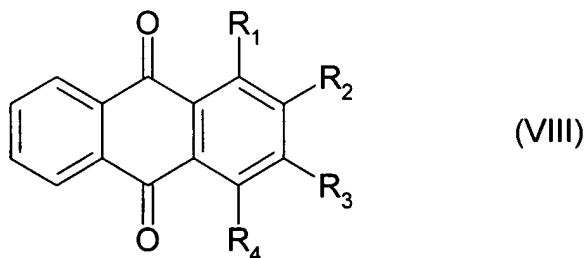
in which,

R<sub>35</sub> and R<sub>36</sub>, which may be identical or different, denote a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl radical, or a phenyl radical,  
Y denotes a -CO- radical or a radical



5 wherein n = 0 or 1, where, when n denotes 1, U denotes a -CO- radical.

13. A composition according to claim 1, wherein said at least one direct dye is acid anthraquinonic dyes of formulae (VIII):



10 in which:

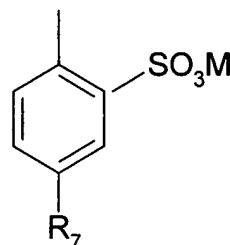
R<sub>1</sub> denotes a hydrogen atom, a -NH<sub>2</sub> radical, or a -NHR<sub>5</sub> radical, as defined below,

R<sub>2</sub> denotes a hydrogen atom or a -SO<sub>3</sub>M radical where M denotes H or an alkaline or alkaline-earth counterion, an organic amine which may be hydroxylated or 15 not hydroxylated, or ammonia,

R<sub>3</sub> denotes a hydrogen atom or a -OH radical,

R<sub>4</sub> denotes a -NHR<sub>6</sub> radical, a -OH radical, or an -NHR<sub>5</sub> radical,

R<sub>5</sub> denotes a radical of structure below:

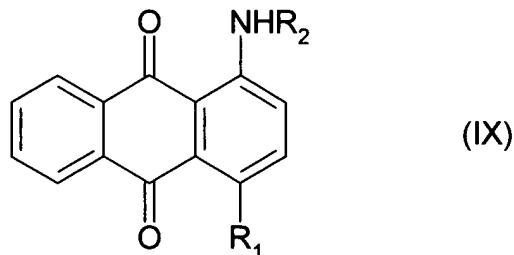


5 in which R<sub>7</sub> represents a C<sub>1</sub>-C<sub>4</sub> alkyl radical,

R<sub>6</sub> denotes a linear or cyclic C<sub>1</sub>-C<sub>6</sub> alkyl radical,

and in which formula (VIII), at least one -SO<sub>3</sub>M radical is present.

14. A composition according to claim 1, wherein said at least one direct dye is  
10 a cationic anthraquinonic dye of formula (IX):



in which:

R<sub>1</sub> denotes a hydrogen atom, a -OH radical, a -NH<sub>2</sub> radical, or a

-NH(C<sub>1</sub>-C<sub>4</sub>)alkyl radical,

R<sub>2</sub> denotes a -(CH<sub>2</sub>)<sub>n</sub>-NR<sub>3</sub>R<sub>4</sub>(R<sub>5</sub>)<sub>m</sub>- radical, in which n denotes 1 or 10, m denotes zero or 1, and

5 R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> which may be identical or different, denotes a hydrogen atom or a C<sub>1</sub>-C<sub>4</sub> alkyl radical, and

wherein R<sub>3</sub> and R<sub>4</sub>, with the nitrogenous atom, can form a 5- or 6-membered heterocycle group which can contain at least one other hetero atom chosen from nitrogen, oxygen or sulphur and optionally having at least one substituent chosen from C<sub>1</sub>-C<sub>4</sub> alkyl radicals, amino radicals, and phenyl radicals.

10 15. A composition according to claim 1, wherein said cosmetically acceptable support suitable for dyeing is an aqueous support comprising water or water and at least one organic solvent selected from alcohols, glycols and glycol ethers.

15 16. A composition according to claim 15, wherein said cosmetically acceptable support suitable for dyeing is present in an amount ranging from 0.5 to 20% by weight relative to the total weight of said composition.

17. A composition according to claim 16, wherein said cosmetically acceptable support suitable for dyeing is present in an amount ranging from 2 to 10% by weight relative to the total weight of said composition.

18. A composition according to claim 1, wherein said composition further comprises at least one adjuvant.

19. A composition according to claim 1, wherein said composition is in the form of a liquid, a cream, a gel, or any other form suitable for dyeing hair.

5 20. A composition according to claim 1, wherein said composition is packaged under pressure in an aerosol can in the presence of a propellant.

*21.* A process of improving the conservation of the dyeing power of a direct dye composition by including in said composition an effective amount of at least one crosslinked polymer containing acrylic residue units of the structure

$$\text{CH}_2=\underset{\underset{\text{R}_1}{|}}{\text{C}}-\underset{\underset{\text{O}}{\parallel}}{\text{C}}-\text{OH}$$

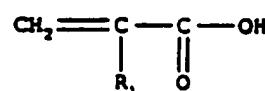
10 in which  $\text{R}_1$  denotes H,  $\text{CH}_3$  or  $\text{C}_2\text{H}_5$ , and  $\text{C}_{10}-\text{C}_{30}$  alkyl acrylate residue units, and wherein said at least one direct dye is chosen from an acidic anthraquinone dye, a cationic anthraquinone dye, an acidic azo dye, and a cationic azo dye.

22. A process according to claim 21, of improving the conservation of the dyeing power of a direct dye composition after storage at low temperatures.

15

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23. A process for dyeing hair by direct dyeing, comprising: applying to said hair when wet or dry an effective amount of a composition comprising, in a cosmetically acceptable support suitable for dyeing, at least one direct dye and at least one crosslinked polymer containing acrylic residue units of the structure



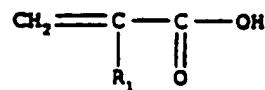
5 in which  $\text{R}_1$  denotes H,  $\text{CH}_3$  or  $\text{C}_2\text{H}_5$ , and  $\text{C}_{10}\text{-C}_{30}$  alkyl acrylate residue units, and wherein said at least one direct dye is chosen from an acidic anthraquinone dye, a cationic anthraquinone dye, an acidic azo dye, and a cationic azo dye.

24. A process according to claim 23, further comprising, after said applying step, leaving said composition on said hair for a period of time; rinsing said hair; optionally washing and rinsing said hair; and drying said hair.

25. A process according to claim 23, wherein said composition is left on said hair for a period of time ranging from 3 to 60 minutes.

26. A process for dyeing hair by direct dyeing, comprising: applying to said hair when wet an effective amount of a composition comprising, in a cosmetically acceptable support suitable for dyeing, at least one direct dye and at least one

crosslinked polymer containing acrylic residue units of the structure



in which  $\text{R}_1$  denotes H,  $\text{CH}_3$  or

$\text{C}_2\text{H}_5$ , and  $\text{C}_{10}-\text{C}_{30}$  alkyl acrylate residue units, and wherein said at least one direct dye is an anthraquinone or azo dye which is acidic or cationic.

5 27. A process according to claim 25, further comprising waiting a period of time after said applying step and before said drying step.

DECEMBER 24, 1992